

KORSHAK, V. V.

4

15.2110

34998
S/190/62/004/003/018/023
B124/B101

AUTHORS: Kovarskaya, B. M., Strizhkova, A. S., Levantovskaya, I. I.,
Shahudash, A. N., Neyman, M. B., Korshak, V. V., Vinogradova,
S. V., Valetskiy, P. M.

TITLE: Study of the thermal degradation of condensation resins. III.
Thermal degradation of heterochain polyesters (polyarylates)

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 3, 1962, 433-439

TEXT: Thermal degradation of polyarylates on the basis of 4,4'-dihydroxydiphenyl-2,2'-propano (DDP) and terephthalic (polyarylate TD) or isophthalic (polyarylate ID) acids prepared either in a high-boiling solvent (petroleum ether) (TD(s) and ID(s), respectively) or by interfacial condensation (TD(i) and ID(i), respectively) is studied in this paper. The yield points of the polyarylates were: TD(s)~340°C; TD(i)~350°C; ID(s)~260°C; ID(i)~270°C. Thermal degradation of the mentioned polymers was investigated between 250 and 525°C. Evolution of gas sets in above 400°C, where 0.26-0.42 mole CO, 0.30-0.60 mole CO₂, and 0.06-0.13 CH₄ per mole of the polyarylate structural unit are liberated. The liquid products of thermal

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Study of the thermal ...

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degradation of TD(s) performed at 450°C show absorption bands at 1365, 1355 and 2970 cm^{-1} characteristic of the methyl group, and at 1735 and 1250 cm^{-1} characteristic of the ester bond. The split absorption band at 1735 cm^{-1} indicates the presence of terephthalic acid, whereas the split band at 1600 cm^{-1} shows free DDP to be present. The infrared spectrum of the solid residue of TD(s) after thermal degradation at 450°C for 1 hour does not contain bands which are characteristic of methyl groups, whereas bands characteristic of the ester bond are established in the infrared spectrum of the solid residue exposed to thermal degradation at 500°C for 1 hour. These bands are lacking in the spectrum of the product exposed to thermal degradation at 600°C for 20 minutes. Absorption spectra of the solid residue of TD(s) and DDP in the region of 700 - 900 and 1600 cm^{-1} show that the concentration of phenyl rings increases after degradation leading to the formation of polyphenylene-like structures. These conclusions were confirmed by the EMR spectra of the residues of thermal degradation of TD(s) at 450, 500, and 600°C. A. A. Berlin and L. A. Blyumenfel'd Vysokomolek. soyed., 2, 1494, 1960, Zhurnal strukturnoy khimii 1, 103.

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Study of the thermal...

S/190/62/004/003/018/023
B124/B101

1960) are mentioned. There are 7 figures, 1 table, and 11 references: 9 Soviet and 2 non-Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy institut plasticheskikh mass
(Scientific Research Institute of Plastics)

SUBMITTED: March 4, 1961.

Card 3/3

36286

S/190/62/004/004/002/019

B119/B138

53200

11.1340

AUTHORS:

Polyakova, A. M., Korshak, V. V., Suchkova, M. D.

TITLE: Study of polymerization of acetylene compounds under pressure. II. Polymerization of propargyl alcohol

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 4, 1962, 486-491

TEXT: Polymerization was studied under varying reaction conditions (pressure: 1 and 1500-6000 atm; at 50 - 200°C; reaction time 1 - 30 hr; with and without addition of various conventional initiators). The infrared and epr spectra of the reaction products were taken. Thermomechanical and elementary analyses of the polymers were made. Results: products varied from liquid, soluble (after reprecipitation, powdery) to solid, unsoluble (molecular weight 387-1500) depending on pressure and temperature. Below 80°C no polymerization took place, even in the presence of initiators at high pressures. The effect of initiators on polymerization was negligible. Polymerization took place on the basis of a rupture of the C≡C bond of propargyl alcohol;

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S/190/62/004/004/002/019

Study of polymerization of acetylene ... B119/B138

macromolecules with conjugated double bonds in the chains were formed. With a prolonged reaction time, at higher temperatures and pressures macromolecules were cross-linked with participation of OH groups. There are 2 figures and 4 tables. The most important English-language reference is: A. L. Henne, K. W. Greenlee, J. Amer. Chem. Soc., 67, 464, 1945.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR
(Institute of Elemental Organic Compounds AS USSR)

SUBMITTED: February 9, 1961

X

Card 2/2

36287
S/190/62/004/004/003/019
B119/B138

5520

AUTHORS:

Korshak, V. V., Vinogradova, S. V., Artemova, V. S.

TITLE:

Study of coordination polymers. XI. Rules governing poly-
coordination in the melt

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 4, 1962, 492-498

TEXT: The polymerization between 4,4'-bis-(acetoacetyl) phenyl ether and beryllium acetoacetate or zinc acetate was studied. The experiments were conducted at 200, 260, and 280°C in nitrogen stream and under vacuum. The mixing ratio of the initial substances was varied. The experiments took 30 min to 19 hr. The relative viscosities of the reaction products were determined. Results: Polycoordination is an equilibrium reaction. The equilibrium of polymer formation can be shifted by eliminating the low-molecular reaction product (acetyl acetone) from the reaction mixture. On the other hand, the polymer is destroyed by heating with acetyl acetone in excess. Be contained in the polymer can be substituted by Cu, (by heating the polymer with Cu acetyl acetonate). The maximum molecular

Card 1/2

53833

11.1380

AUTHORS:

Korshak, V. V., Zamyatina, V. A., Oganesyan, R. M.

TITLE:

Polycondensation and copolymerization of N-substituted boroazole with bifunctional compounds

PERIODICAL:

Vysokomolekulyarnyye soyedineniya, v. 4, no. 4, 1962,
615-616

TEXT: This letter to the editor contains the information that N-substituted boroazole is suitable for polycondensation and copolymerization. Heat-resistant polymers are formed thereby, which, in individual cases, are highly elastic over a wide temperature range (up to 350°C). Hydrogen was separated during the reaction of N-phenyl boroazole with eicosane-diol, and a polymer, rubberlike at room temperature, was found. Migrational copolymerization of N-triphenylboroazole with hexamethylene diisocyanate produced a polymer with a relative viscosity of the solution in cresol of 0.13 and a brittle point of 145°C: $C_{30}H_{36}B_3N_6O_3$. A similar polymer with a relative viscosity of 0.54 was obtained from trimethylboroazole. Copolymerization of N-phenyl boroazole with divinyl benzene produced a polymer insoluble in

36303

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S/190/62/004/004/019/019
B117/B138

Polycondensation and copolymerization...

cresol with a brittle point of 105°⁰C: C₃₃H₃₃B₃N₃. [Abstracter's note:
Essentially complete translation.]

SUBMITTED: October 14, 1961

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37428

S/190/62/004/005/002/026
B119/B101

15. 8/10

AUTHORS: Iskenderov, M. A., Korshak, V. V., Vinogradova, S. V.

TITLE: Heterochain polyesters. XXXV. Polyarylates on the basis
of 1,6-dihydroxy naphthalene

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 5, 1962,
637 - 641

TEXT: The authors studied the effects of several factors on the yield
and on the reduced viscosity of polyarylates prepared by interfacial
condensation of 1,6-dihydroxy naphthalene with adipic, sebacic, isophthalic,
or terephthalic acid chlorides: (1) of emulsifiers (alkamone Δ (D),
sodium oleate, mersolate, Novost', OP-20 (OP-20), Nekal, wetting agent
H6 (NB), Trilon B, "Kontakt Petrova" and of their concentrations. ✓
(0.25 - 2.50%); (2) of solvents for the acid chloride (benzene, toluene,
o-, m-, p-xylene, Tetralin, chloroform, carbon tetrachloride, dichloro
ethane, ditolyl methane, n-hexane), of catalysts (triethyl amine, dimethyl
aniline, tetraethyl ammonium bromide, zinc chloride, lead oxide, zinc

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B119/B101

Heterochain polyesters...

acetate) and of their concentrations (0.5 - 3.5%); (3) of the concentrations of the acid chloride solution (0.1 - 1 N). The highest yields (61 - 89%) and values of reduced viscosity (0.20 - 0.32) were obtained by using 1% by weight of emulsifiers with respect to the aqueous phase (OP - 20 for the polyarylates of aliphatic acids and sodium oleate for the polyarylates of isophthalic acid), n-hexane as a solvent, and 2 % tetraethyl ammonium bromide and triethyl amine as catalysts. There are 6 tables.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR
(Institute of Elemental Organic Compounds of the AS USSR)

SUBMITTED: February 9, 1961

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30278

3/190/62/004/006/004/026
B110/B138

15-2180
AUTHORS: Korshak, V. V., Krongauz, Ye. S., Gribkova, P. N., Vasnev,
V. A.

TITLE: Investigations in the field of polymers with coordination
chains. XIII. Study of the laws governing polycoordination
reactions in solution

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 6, 1962, 815-820

TEXT: The effect of experimental conditions on the molecular weight of
polymers was also investigated. 4,4'-bis-(acetoacetyl)diphenyl oxide, Zn^{2+}
whose polymer with Zn is soluble in dimethyl formamide, reacted with Zn^{2+}
ions. The amount of reacted tetraketone and the molecular weight of the
polymer were determined by titration of the terminal enol groups, using
Na methylate and thymol blue, as there is only one possibility for the
terminal groups: Tk-Me-Tk-Me...Tk-Me-Tk, where Me = metal and Tk = sub-
stituted tetraketone. Synthesis takes place by: (1) reaction of alco-
holic solutions of $Zn(CH_3COO)_2$ and I; (2) reaction of an aqueous
 $Zn(CH_3COO)_2$ solution with a benzene solution of I at the phase interface;
Card 1/4

Investigations in the field...

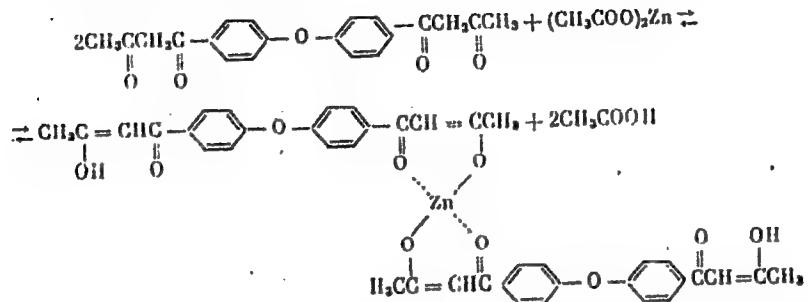
5/190/62/004/006/C04/026
B110/B138

(3) condensation of an aqueous solution of acetic zinc ammoniate at the interface with solution I in n-xylene; (4) reaction of I with $Zn(CH_3COO)_2$ in dimethyl formamide solution. In the case of (1), 1 mole of alcoholic $Zn(CH_3COO)_2$ solution reacted with 1 mole solution of I at 20°C to ~80% of I during the first minutes, and to 85% after 1 hr. The molecular weight was 750 (dimer: Tk-Me-Tk). The dimer insoluble in methanol is precipitated and destroys the homogeneity of the reaction medium and the growth of the polymer chain. In the case of (2), polycondensation between the phases, the polymer chain grew more quickly. Interphase polycondensation produces polymers of higher molecular weight than equilibrium polycondensation. During the reaction of the benzene solution of I with the aqueous solution of $Zn(CH_3COO)_2$ at the interface

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B110/B138

Investigations in the field...



takes place. The acetic acid formed destroys the complex obtained. The destructive effect of acetic acid is stronger in the water-benzene medium than in methanol, owing to greater dissociation. In the case of (3) (ratio 1:2), I was almost completely polycondensed in a few minutes at 20 and 50°C, at a ratio of 1:1 and 20°C to about 85%. The trimer Tk-Me-Tk with molecular weight 1150 was obtained, as equilibrium set in between the initial zinc ammonium complex and the polymer complex of zinc which formed with I, the instability constants of which were about equal.
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B110/B138

Investigations in the field...

Equimolecular amounts of I with the acetic zinc ammoniate in dimethyl formamide (N_2 atmosphere) at 140 - 150°C, after 0.5 hr, produced a polymer with 85 - 90% yield and molecular weight 1000 - 1100. The white product obtained after 7 hr was quite insoluble in dimethyl formamide. It was separated into: a fraction with molecular weight 750, soluble in chloroform; two fractions (mixture of trimer and tetramer), molecular weight 1250, soluble in dimethyl formamide; three insoluble, high-molecular fractions. Gradual growth of the polymer chain is assumed: high rate of polycoordination and formation of insoluble adducts in the first stage interrupt chain growth and cause formation of a low-molecular product. There are 2 tables.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR (Institute of Elemental-organic Compounds AS USSR)

SUBMITTED: February 28, 1961

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38290
S/190/62/004/006/017/026
B110/B138

15.7.800
AUTHORS: Korshak, V. V., Smirnov, R. N.

TITLE: Variation in the state of aggregation of polymers due to
mercurization

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 6, 1962, 889-893

TEXT: The relationship was studied, between the structure of an initially amorphous polymer and the possibility of its transformation into the crystalline state as a result of mercurization. Natural rubber dissolved in xylene was mixed with 10% aqueous mercury acetate solution. After 30 days a cheesy cream-colored precipitate with 32.86% bonded Hg was obtained from the emulsion by adding alcohol and 10% NaCl solution. The rubbers CK6M (SKBM), CK5 (SKB) and CK-30-A (SKS-30-A) formed crystalline mercury derivatives $(OH) \cdot Hg(CH_3COO)$, with the coefficients: $k = 1.15$, $k = 0.664$; $k = 1.09$, $k = 0.49$; $k = 2.42$, $k = 1.04$. Ebonite powder (24.76% S) produced a mercury derivative of disordered structure with 31.75% Hg. Casein, gelatin and albumin were mercurized with aqueous NaOH and 15 g yellow mercuric oxide. The Hg content of the derivatives was: 41.12% (casein),

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B110/B138

Variation in the state of...

31.62% (gelatin), 32.76% (albumin). Novolack K-18/2 (K-18/2) (linear structure, melting point 87°C, free phenol content 6.5%) from the "Karbolit" plant was extracted for eight days in a Soxhlet apparatus. Part was converted into an infusible, insoluble state, probably of poly-oxycycliphane lattice structure (according to V. V. Korshak, Khimiya vysokomolekulyarnykh soyedineniy (Chemistry of High-molecular Compounds), Izd. AN SSSR, 1950). Mercurization was carried out for 6 hr at 90°C of 2 days at room temperature, with aqueous 10% mercury acetate (20% surplus). The mercury derivatives of phenol were extracted from the bright red powder by means of water, alcohol and acetone, and a crystalline substance with the substitution coefficient 0.572 (related to the monomercuryalogen) was obtained. Cresylic resin with H_2O_2 as catalyst and mercury acetate produced a yellowish brown product with 46.56% Hg. The mercury derivative of petroleum coke contained 27.22% Hg. Results: During mercurization amorphous polymers of non-, or weakly built-up linear structure become crystalline through phase transformation. Built-up amorphous polymers of trimeric structure do not become crystalline. Built-up polymers and albumin polymers form crystalline compounds with low yield. Since the macromolecules get heavier by Hg enrichment, the carbon atoms are

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B110/B138

Variation in the state of...

regrouped and the spacing of the C-C bonds is partly changed. All thermographs show a decrease in thermodynamic stability of mercurized polymers, low physical and mechanical stability and low electric conductivity. Products of mercurization are: (1) crystalline polymers from the amorphous state and (2) graft polymers, for which no monomers exist. Investigation of the mercury derivatives will provide further information on the amorphous state of polymers. There are 3 figures.

ASSOCIATION: Institut goryuchikh iskopayemykh AN SSSR (Institute of Mineral Fuels AS USSR)

SUBMITTED: April 12, 1961

Card 3/3

KORSHAK, V.V.; VINOGRADOVA, S.V.; LEHEDEVA, A.S.; Prinimala uchastiye:
RESHETNIKOVA, L.L., laborant

Heterochain polyesters. Part 35: Some regularities in interfacial
polyesterification. Vysokom.soced. 4 no.7:968-971 Jl '62. (MIRA 15:7)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Esterification)
(Polymers)

KORSHAK, V.V.; VINOGRADOVA, S.V.; U BAN-YUAN' [Wu Pang-yüan]

Heterochain polyesters. Part 36: Interfacial polycondensation of bis(p-chlorocarboxyphenyl)methylphosphine oxide with 4,4'-dihydroxyphenylpropane. Vysokom.soced. 4 no.7:982-986 J1 '62. (MIRA 15:7)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Phosphine oxide) (Cumene) (Esterification)

KORSHAK, V.V.; VINOGRADOVA, S.V.; VALETSKIY, P.M.; Prinimala uchastiye:
MIKHAYLINA, A.I., laborant

Heterochain polyesters. Part 37: Mixed polyarylates based
on terephthalic acid, dihydroxyphenylpropane, and aliphatic
polyhydric alcohols. Vysokom. soed. 4 no.7:987-994 Jl '62.
(MIRA 15:7)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Cumene) (Terephthalic acid)
(Alcohols)

39843
S/190/62/004/008/001/016
B117/B144

5.3832

AUTHORS: Korshak, V. V., Rogozhin, S. V., Makarova, T. A.

TITLE: Investigation into coordination polymers. XIV. Reaction of phenyl thallium diisobutyrate with dicarboxylic acids and their derivatives

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 8, 1962,
1137 - 1141

TEXT: The reaction of phenyl thallium diisobutyrate with adipic, azelaic, and sebatic acids in ethyl alcohol at 40°C yielded white powdery polymers. When compounds insoluble in aliphatic solvents were dissolved in aromatic solvents, acetic acid and in dimethyl formamide they yielded solutions of low viscosity (~ 0.04 - 0.08). This is attributed to the spherical shape of the macromolecules or to cleavage of their chains in solution. It was found that the reaction of phenyl thallium diisobutyrate with dicarboxylic acids (with or without solvents) at temperatures of 150 - 155°C not only yielded polymers but caused decomposition of phenyl thallium diisobutyrate. The carbon content was considerably reduced by separation of phenyl

X

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APPROVED FOR RELEASE: 06/14/2000

CIA-RDP86-00513R00082493000

S/190/62/004/008/001/016
B117/B144

Investigation into coordination...

groups, causing discoloration (brown) and reducing the polymer solubility. The melting points of the polymers lay between 140 and 250°C, depending on the conditions of synthesis. Polymers containing thallium were obtained from α, α' -dihydroxy and α, α' -dimethoxy sebatic acids, owing to the weak bond between acyl groups and thallium. Besides pure ion bonds the polymers form coordination bonds with metal ions. The solubility of these polymers in organic solvents is limited. Thus it was shown that the dissolution of polymers containing metals is inhibited or reduced by the introduction of hydroxy and methoxy groups, respectively, into the α -position to the carboxylic group. There are 3 tables.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR
(Institute of Elemental Organic Compounds AS USSR)

SUBMITTED: April 10, 1961

Card 2/2

KORSHAK, V.V.; ROGOZHIN, S.V.; MAKAROVA, T.A.

Coordination polymers. Part 15: Interaction of organotin compounds with dicarboxylic acids and their derivatives.
Vysokom. soed. 4 no.9:1297-1302 S '62. (MIRA 15:11)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Tin organic compounds)
(Acids, Organic)

S/190/62/004/009/003/014
B101/B144

AUTHORS: Korshak, V. V., Vinogradova, S. V., Wu Pang-yüan

TITLE: Heterochain polymers. XXXIX. The significance of the hydrolysis of bis-(p-carboxy-phenyl)-methyl phosphine oxychloride for interface polycondensation

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 9, 1962, 1320-1323

TEXT: In a previous paper (V. V. Korshak et al., Vysokomolek. soyed., 3, 371, 1961) hydrolysis of the chloride group was assumed to occur as a side reaction during the formation of polyarylates of bis-(p-carboxy-phenyl)-methyl phosphine oxychloride (I) by interface polycondensation. The course of such hydrolysis was now studied by mixing the benzene solution of I with water and by conductometric titration of the resulting HCl. Results: (1) At 25°C, the chloride first saponifies rapidly: after 5 min 37.23%, after 10 min 37.68%, and after 60 min 48.46%. (2) A rise in temperature accelerates the hydrolysis, 28.02% chloride being saponified after 30 min at 7°C and 60.37% at 60°C. (3) The presence of NaOH increases the rate of hydrolysis. (4) A change in concentration of I from 0.025 to 0.250 moles/l

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41417

63923
S/190/62/004/010/001/010
B101/B186

AUTHORS: Korshak, V. V., Vinogradova, S. V., Frunze, T. M., Kozlov, L. V., Wu Pang-yüan

TITLE: Heterochain polymers. XL. Synthesis of polyamide esters by interfacial polycondensation

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 10, 1962, 1457-1462

TEXT: A comparison is made between the properties of polycondensates obtained by interfacial polycondensation (iC) and equilibrium polycondensation (eC) of sebamic chloride (I), diane(4,4'-dihydroxy-diphenyl propane) (II), and hexamethylene diamine (III). Interfacial polycondensation was achieved by mixing 0.2 N alkaline solutions of II and III with I dissolved in hexane, and eC was brought about by heating the component mixture first in N_2 and then in vacuo, the ratio I : II : III being varied between 1 : 1 : 0 and 1 : 0 : 1. Homopolymers could be separated from the reaction product since the homopolymer I + III is insoluble in

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B101/B186

Heterochain polymers. XL...
18

p-xylene, whereas homopolymer I + II is soluble in p-xylene. The nitrogen content of the reaction product soluble in p-xylene confirmed the formation of a polyamide ester.³ The differences observed between the products obtained by iC and eC are that the product from eC, containing less than 40% III, was better soluble in p-xylene than product from iC containing the same amount of III, whereas the eC products containing more than 40% III were not as easily soluble as the comparable iC products. Furthermore, the softening points of iC products containing less than 40% III were lower than those of the corresponding eC products. The thermomechanical curves of the iC products were flatter. At a component ratio of 1 : 0.5 : 0.5, the nitrogen contents in the insoluble part of the polymer obtained by iC and eC were ~ 8.7% and ~ 4.2%, respectively, that in the soluble part being ~ 1.9% in iC and ~ 3.6% in eC. Conclusion: I diffuses from the organic into the aqueous phase owing to hydrolysis during iC; III diffuses into the organic phase more readily than II. Hence, the polymer formed from the organic phase should contain amide units, and the product formed from the aqueous phase and should be enriched with ester units.¹ This was confirmed by iC when the mixture was stirred at varying speeds.¹ At a ratio of 6 : 5 : 1 and at 1000 rpm, the

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B101/B186

Heterochain polymers. XL. ...

polymer had a nitrogen content of 7.02% and a softening point of 194°C, at 6000 rpm, the nitrogen content was 2.07% and the softening point was 47°C. At a ratio 1 : 1 : 1, a polymer containing ~8.9% nitrogen was obtained in both cases. Hence, III has a greater reactivity than II. There are 2 figures and 3 tables. The English-language reference is: W. M. Eareckson, J. Polymer Sci., 40, 399, 1959.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR
(Institute of Elemental Organic Compounds AS USSR)

SUBMITTED: May 19, 1961

Card 3/3

41419
S/190/62/004/010/003/010
B144/B186

15 Oct 92
AUTHORS: Korshak, V. V., Mozgova, K. K., Shkolina, M. A.,
Korostylev, B. N., Linovetskaya, O. Ya., Zasechkina, A. P.

TITLE: Synthesis of graft copolymers

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 10, 1962,
1469-1473

TEXT: The copolymerization of polyethylene terephthalates (I) ("Lavsan", Hostaphan, Cronar) with monomers and monomer mixtures was studied in an attempt to increase the adhesiveness between (I) and the photographic emulsion layer containing gelatin. After a heat treatment of no more than 10 min at 90 - 120°C, the samples were kept immersed in the monomer or monomer mixture for 7 - 64.5 hrs at 40 - 80°C. 2-methyl-5-vinyl pyridine, vinyl pyrrolidone, and methyl methacrylate (II) were used singly or in mixtures with acrylonitrile, methacrylic acid (III), epoxy resin, styrene, carbinol cement, and gelatin dissolved in acrylic acid (IV). After treatment with solvents such as benzene or water, and desiccation, the adhesiveness was examined by way of the 5-ball system.

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Synthesis of graft copolymers

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B144/B186

The tensile strength of 8 x 10 mm specimens was tested with a Schopper dynamometer at an elongation rate of 10 cm/min. Levsan, Hostaphan, and Cronar behaved similarly. The best adhesiveness was reached by copolymerizing (I) with (II-III) mixtures independently of their mixing ratio, and with (IV) in thin monomer layers (2 - 3% by weight). The viscosity could not be tested, as (I) after grafting, was no longer soluble in xylene. Grafting reduced the elongation at rupture, whilst slightly increasing the tensile strength, but did not affect the optical properties and orientation. There are 1 figure and 4 tables.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR
(Institute of Elemental Organic Compounds AS USSR)

SUBMITTED: May 20, 1961

Card 2/2

42319

152450

S/190/62/004/011/002/014
B119/B186

AUTHORS: Korshak, V. V., Mozgova, K. K., Krukovskiy, S. P.

TITLE: Synthesis of graft copolymers. X. Grafting of styrene onto polyethylene terephthalate (Lavsan)

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 11, 1962,
1625 - 1630

TEXT: Lavsan films of about 30μ thickness were copolymerized with styrene at 80°C after activation by heating in air at 100°C . The copolymer yield depends on the activation time of the Lavsan films; it shows a large maximum after 3 min heating, and a smaller maximum after 15 min. The copolymer yield increases with the duration of the copolymerization reaction; a film activated for 3 min absorbs about 70% of its weight of styrene after an 8-hr reaction. About 5% of the styrene quantity used is homopolymerized. The intrinsic viscosity of solutions of grafted films in tricresol increases with the amount of styrene absorbed, reaching a maximum of 1.569 when the content of grafted styrene in relation to the weight of the film used is 106.7%. With growing

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S/190/62/004/011/002/014

B119/B186

Synthesis of graft copolymers...

polystyrene content in the copolymer the tensile strength of films decreases, and their relative ductility increases. The grafted films (like pure Lavsan) have a melting temperature of 240 - 242°C. Lavsan films containing 50 - 100% polystyrene undergo only swelling in cold concentrated H_2SO_4 , and are not destroyed by boiling 40% KOH even after 100 hrs. There are 6 figures and 2 tables.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR (Institute of Elemental Organic Compounds AS USSR)

SUBMITTED: June 2, 1961

Card 2/2

KOBSHAK, V. V.; KRONGAUZ, Ye. S.; GRIBKOVA, P. M.

Preparation of a polymer from diphenylbenzylphosphine oxide by
polyrecombination reaction. Izv. AN SSSR. Otd. khim. nauk no. 9:1638-1644
S '52. (MIRA 15:10)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Phosphine oxide) (Polymers)

SOSIN, S.L.; KORSHAK, V.V.; VASNEV, V.A.; BARANOV, Ye.L.

Synthesis of polymers from nitriles of aliphatic acids. Izv.AN SSSR.Otd.
khim.nauk no.9:1644-1650 S '62. (MIRA 15:10)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Nitriles) (Polymers)

KORSHAK, V.V.; ZAMYATINA, V.A.; OGANESYAN, R.M.

Copolymerization of nitrogen-substituted borazoles with hexamethylene diisocyanate. Izv.AN SSSR.Otd.khim.nauk no.9:1669-1670 S '62.
(MIRA 15:10)

1. Institut elementoorganicheskikh soyedinenii AN SSSR.
(Borazine) (Cyclohexane) (Polymerization)

43462
S/190/62/004/012/001/015
B101/B186

15.8080

AUTHORS: Korshak, V. V., Frunze, T. M., Krasnyanskaya, E. A.

TITLE: Heterochain polyamides. XXXI. Effect of the cyclizing capacity of monomers on the polymer chain termination process

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 12, 1962,
1761-1769

TEXT: The peculiarities of the polycondensation of succinic acid (I) with hexamethylene diamine (II) were studied. Hexamethylene disuccinimide (III), m.p. 117-118°C, which has not hitherto been described, was synthesized by reaction of 2 moles I with 1 mole II at 200-210°C, or by reaction of the neutral hexamethylene diamine succinate with 1 mole I at 160°C. Poly-hexamethylene diamine succinamide (IV), m.p. 275-280°C, molecular weight 1500-3100, was obtained by reaction of hexamethylene diamine succinate with I at 220°C, or by reaction of III with II at 160-210°C, or by interfacial polycondensation of succinyl chloride, dissolved in benzene, with aqueous alkaline solution of II. Heating of IV to 280°C and above does not yield polymers of a higher molecular weight, but leads to thermal degradation

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S/190/62/004/012/001/015
B101/B106

Heterochain polyamides. XXXI. Effect...

with liberation of II. A wax-like red substance with m.p. 130°C is formed. This is explained by chain termination owing to formation of succinimide rings at the end of the macromolecule. First the linear polyamide chain breaks, and forms succinimide and amino end-groups; then cyclization occurs with liberation of II. This "cycloimide effect" was confirmed by the fact that the IR spectrum of IV showed the 1780 and 1690 cm^{-1} bands of the succinimide ring besides the 1690 and 1550 cm^{-1} bands of the amido groups. Moreover, the content of titrimetrically determinable carboxyl end-groups in the polyamide was, owing to the cyclization, lower than the content of amino end-groups, and the content of COOH groups decreased further with an excess of I. With equimolecular ratio of I and II, the polyamide contained 50% amino end-groups, 5.6% carboxyl groups, and 44.4% cyclic (succinimide) end-groups, whereas the values were 2%, 2%, and 96%, respectively, with an 80% excess of I. The succinimide ring is not stable; it opens on heating, and a linear polyamide is formed. Such formations of five- and six-membered rings are assumed to be a frequent cause of chain termination in the polycondensation of dicarboxylic acids with diamines. It occurs in the polycondensation of succinic and glutaric acid both with hexamethylene diamine and with ethylene diamine and trimethylene diamine. It probably

Card 2/3

BR

S/063/62/007/002/001/014
A057/A126

AUTHOR: Korshak, V.V. Corresponding Member

TITLE: News on the synthesis of elementorganic high-molecular weight compounds

PERIODICAL: Zhurnal vsesoyuznogo khimicheskogo obshchestva imeni D.I. Mendeleyeva, v. 7, no. 2, 1962, 122 - 131

TEXT: The most important syntheses of elementorganic high polymers and the latest results in this field published in literature are discussed. Methods of synthesis and polymers of elements of each group of the periodic system of elements are discussed separately. The main part of cited Soviet investigations was carried out by the author and/or his co-workers. Polycondensation of phosphoorganic polymers based on A.Ye. Arbuzov's reaction is mentioned among other methods, such as polymerization of cyclic compounds (silicoorganic compounds), polycoordination (chelation), polyrecombination, cyclopolymerization, copolymerization by migration (reaction by N.P. Grechkin), or syntheses from organic high polymers with carbohydrate chains by introducing various elements into the macromolecule. Thorough investigations of copper coordination polymers obtained

Card 1/3

S/063/62/007/002/001/014
A057/A126

News on the synthesis of elementorganic

by means of various tetraketones were carried out in the USSR. Mercury polymers were manufactured by polymerization of non-saturated mercuryorganic compounds. Intensive studies were carried out on boron containing polymers. Thus the present author and collaborators prepared linear polymers containing boron and nitrogen (or aluminum) in the chain. Reactions on the introduction of thallium into poly- α -vinylthiopene and polystyrene, preparations of polyorganosiloxane-phosphoalumoxanes and polymers containing a carbon-silicone bond in the main chain were also investigated by Soviet workers. Among silane derivatives, a new type of isotactic polymers was obtained in the presence of $(C_2H_5)_3Al + TiCl_4$ as catalyst. Triethylsilyl esters were found to be good dielectrica. In some investigations of the present author polymers of ethyltrivinyl- and diethyldivinyl-germanium were prepared under high pressure, as well as tetravinyl-, triethyl-vinyl-, or divinyl-diethyllead copolymerized with styrene, or α -methylstyrene. The basic reaction between phosphorus pentoxide and aluminum phenolates carried out by Soviet workers is cited among methods for the preparation of polyphosphonamides. Further are mentioned syntheses carried out by the present author and co-workers to prepare perfluorobutadiene polymers (obtained under high pressure) and preparations of polymers, containing Co and Ni by reaction of various complexing agents with salts, or acetoacetate complexes of these metals. Con-

Card 2/3

News on the synthesis of elementorganic

S/063/62/007/002/001/014
A057/A126

cluding the present review, the author refers to the great number of new polymers containing elements not used until now for this purpose. However, the practical use of some of them is not determined yet, so there are new possibilities given in polymer chemistry, or chemical technology. There are 114 references.

ASSOCIATION: AN SSSR (AS, USSR)

Card 3/3

KORSHAK, V.V.; SOSIN, S.L., kand.khim.nauk

New method of the synthesis of polymers. Priroda 51 no.4:98-101
Ap '62. (MIRA 15:4)

1. Institut elementoorganicheskikh soyedineniy, Moskva.
2. Chlen-korrespondent AN SSSR (for Korshak).
(Polymerization)

KORSKAH, V.V.; ZAMYATINA, V.A.; OGANESYAN, R.M.

Polycondensation of N-triph~~om~~ylborazole with polyols. Izv. AN SSSR.
Otd.khim.nauk no.10:1850-1852 O '62. (MIRA 15:10)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Borazine) (Alcohols) (Polymerization)

S/020/62/144/001/016/024
B119/B144

AUTHORS: Korshak, V. V., Corresponding Member AS USSR, Sladkov, A. M., and Kudryavtsev, Yu. P.

TITLE: Oxidative dehydropolycondensation of 2,6-dimethyl-3,5-diethinyl pyridine and 9,10-diethinyl-9,10-dihydroxy-9,10-dihydro-anthracene

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 144, no. 1, 1962, 115 - 117

TEXT: The authors checked their assumption that the reaction

$n \text{HC}\equiv\text{C}-\text{R}-\text{C}\equiv\text{CH} \xrightarrow[\text{Cu}^+]{\text{O}_2} -[\text{C}\equiv\text{C}-\text{R}-\text{C}\equiv\text{C}]_n-$ must lead to soluble products

(1) if it takes place in the presence of compounds containing only one $\text{HC}\equiv\text{C}$ group (lower molecular weight by early chain rupture); (2) if it proceeds with compounds where R is a large hydrocarbon group, or (3) if R represents a polar group. The compounds mentioned in the title were condensed alone, and also in the presence of acetylene, p-diethinyl benzene, phenyl acetylene, propargyl alcohol, and 2-methyl-5-ethinyl pyridine. The structure of the

Card 1/2

Card 2/2

KORSHAK, V. V.

11.11.
5/20/62/144/004/019/024
2,7160

2
S/020/62/144/004/019/024
B101/B138

AUTHORS: Myl'nikov, V. S., Sladkov, A. M., Kudryavtsev, Yu. P.,
Luneva, L. K., Korshak, V. V., Corresponding Member AS USSR,
and Terenin, A. N., Academician

TITLE: Photo-semiconductor properties of acetylene polymers

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 144, no. 4, 1962, 840 - 843

TEXT: Data for the polyacetylenes I - VIII are reported from the laboratory directed by A. N. Terenin where research on photosensitive polymers has long been proceeding. The compounds were synthesized in the laboratory directed by V. V. Korshak. I, II and III were very photosensitive in

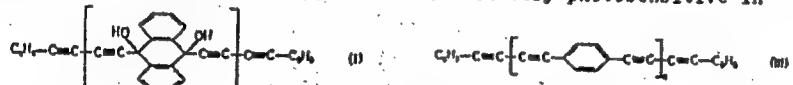
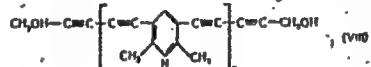
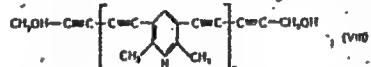
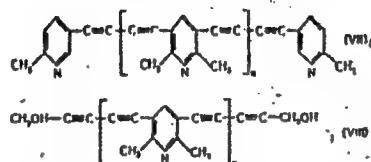
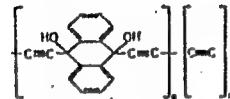


Photo-semiconductor properties...

S/020/62/144/004/019/024
B101/B138

(IV)



modulated light (10 mv/mw at 300 cps). IV, V and VI were less photo-sensitive; VII and VIII showed no photo-emf. In I - IV the conductivity was of p type, in V and VI it was of n type. I and II were examined more closely. Results: (1) The spectral distribution of photo-emf showed a reduction in this effect at 200 + 600 $\text{m}\mu$ with a narrow selective peak of exciton type at $\lambda = 480 \text{ m}\mu$ in the case of I and a wide peak in this range for II. (2) Preliminary illumination of II for 2 hr in ultraviolet light from an $\text{C}_6\text{H}_6\text{-120}$ (SVD-120) mercury lamp increased its photo-emf by one order of magnitude. The long-wave threshold of activation is at 366 $\text{m}\mu$ and the 405 $\text{m}\mu$ line is inactive. (3) Preliminary illumination is more effective in vacuo than in air. The photo-emf of I increases during the first

Card 2/3

Photo-semiconductor properties ...

2
S/020/62/144/004/019/024
B101/B138

3 - 5 min lighting, then slowly decreases, but after approx. 1 hr regains its initial value. After 1 - 2 hr storage in the dark this process is repeatable. (4) If II is activated by UV light in vacuo the admission of air immediately reduces its photo-omf to $1/2 - 1/3$. This effect is also repeatable. These results are explained by the UV light ionizing the conjugated molecules so that positively charged local centers are formed which act as electron traps. The photoelectron is retained in the polymer structure according to E. C. Lim, G. W. Swenson (J. Chem. Phys., 36, no. 1, 118 (1962)). The absorption of light permits the origination of an exciton which migrates between the molecules and disintegrates on a defect produced by the UV light to form a mobile hole and an electron trapped by the defect. Accordingly it should be possible to synthesize photosensitive polymers. There are 3 figures.

SUBMITTED: April 20, 1962

Card 3/3

5.400
15.940

11738

S/020/62/146/006/012/016
B106/B186

AUTHORS: Korshak, V. V., Corresponding Member AS USSR, Tsvankin, D. Ya., Krukovskiy, S. P.

TITLE: Investigation of polyethylene terephthalate (Lavsan) foils with grafted polystyrene

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 146, no. 6, 1962, 1347-1348

TEXT: With a view to investigating how much the structure of a polymer foil is affected by grafting another polymer onto the same, the following grafting experiments were made: amorphous layers of polystyrene of different thicknesses were grafted onto two 28- μ thick crystalline foils of polyethylene terephthalate by keeping the mixture of both compounds at 80°C for 3 and 8 hrs, respectively, in a nitrogen atmosphere together with styrene. Results: after heating the mixture for 3 hrs, a foil 46 μ thick with a yield of 20.95% (by weight of the initial foil) of grafted polystyrene was obtained and after heating the same for 8 hrs, a foil, 143 μ thick with a yield of 195% was the result. For control purposes, two foils were prepared by laminating the same original materials in a simple manner, using

Card 1/2

S/020/62/146/006/012/016
B106/B186

Investigation of polyethylene ...
the same proportions by weight. X-ray pictures of the two grafted samples
were compared with the two control samples. In addition, cross-sectional
photographs of the grafted samples were examined. The polyethylene
terephthalate foil was found to remain unaffected by the grafted polystyrene.
This indicates that the major part of crystals of the initial foil does not
participate in the grafting process and that neither the structure nor the
relative orientation of crystallites in the foil is disturbed. The cross-
sectional photographs revealed a comparatively sharp boundary between the
grafted layer of polystyrene and the initial foil. The transition zone is
considerably smaller than the thickness of the grafted layer. All this
shows that grafting occurs only in an extremely thin surface layer of the
foil. The polymer used for grafting will not penetrate farther into the
base foil even if its thickness is increased. There are 2 figures.

SUBMITTED: June 5, 1962

Card 2/2

8/020/62/147/006/021/034
B144/B101

AUTHORS: Korshak, V. V., Corresponding Member AS USSR,
Vinogradova, S. V., Teplyakov, M. M., Chernomordik, Yu. A.

TITLE: Polyester - polyamide interaction in melts

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 147, no. 6, 1962,
1365-1368

TEXT: The exchange reaction between equimolecular amounts of polyethylene sebacinate and polyhexamethylene sebacinic amide was studied at 290°C in an N₂ stream in order to explain the formation of polyamide esters from complete polymers. The occurrence of an exchange reaction between amide and ester groups was proved by a preliminary experiment with acetanilide and benzyl benzoate. In polymers it was proved by comparing the properties of products obtained after 1-12 hrs with those of the polyamide ester obtained by aminolysis of polyethylene sebacinate with hexamethylene diamine, and also by turbidimetric titration. There were three possibilities of reaction: (1) Interaction between amide bonds and ester bonds of neighboring chains; (2) exchange on the active end

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Polyester - polyamide interaction ...

8/020/62/147/006/021/034
B144/B101

SUBMITTED: September 17, 1962

Card 3/3

- KORSHAK, V.V.; FRUNZE, T.M.; VINOGRADOVA, S.V.; KURASHEV, V.V.; LEBEDEVA, A.S.

Role of acid chloride hydrolysis of some aliphatic and aromatic dicarboxylic acids in the process of interfacial polycondensation. Izv. AN SSSR. Otd. khim. nauk no. 10:1807-1813 0 '62. (MIRA 15:10)

AKUTIN, M. S.; KORSHAK, V. V.; RODIVILOVA, L. A.; VINOGRADOVA, S. V.;
BUINITSKIY, Yu. M.; VALETSKIY, P. M.; LEZEDSVA, A. S.; Prinimali
uchastiyer: BONDAREVA, Ye. A., laborant; RESHETNIKOVA, L. M.,
laborant; KOVALEVA, T. G., laborant

New data on the processing and properties of polyarylates.
Plast. massy no.11:20-26 '62. (MIRA 16:1)

(Esters) (Condensation products (Chemistry))

KORSHAK, V.V.; FRUNZE, T.M.; KOZLOV, L.V.

Heterochain polyamides. Report No.32: Formation of mixed polyamides
at the interface of various diamine mixtures, Izv.AN SSSR. Otd.khim.
nauk no.11:2062-2069 N '62.
(MIRA 15:12)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Polyamides) (Amines)

KNYAZEVA, T.S.; KORSHAK, V.V.; AKUTIN, M.S.; KULEVA, M.M.; VINOGRADOVA, S.V.;
RODIVILOVA, L.A.; NEDOPEKINA, T.P.; VALETSKIY, P.M.; MOROZOVA, S.A.;
SALAZKIN, S.N.

Possibility of using various polyarylates as insulating film
materials. Plast. massy no.12:37-40 '62. (MIRA 16:1)
(Acids, Organic) (Polymers) (Insulating materials)

KORSHAK, V. V.; FRUNZE, T. M.; KOZLOV, L. V.

Heterochain polyamides. Report No. 33: Formation of mixed polyamides at the interface mixtures of various acid chlorides. Izv. AN SSSR Otd. khim. nauk no. 12:2226-2235 D '62.
(MIRA 16:1)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.

(Polyamides) (Acids, Organic)
(Condensation products (Chemistry))

KORSHAK, V. V.; SLADKOV, A. M.; LUNEVA, L. K.

Elementoorganic polymers. Izv. AN SSSR Otd. khim. nauk no.12:
2251-2253 D '62. (MIRA 16:1)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Polymers) (Organometallic compounds)

KORSHAK, V. V.; VINOGRADOVA, S. V.; TEPLYAKOV, M. M.;
CHERNOGORODIK, Yu. A.

Interaction between polyether and polyamide in a melt. Dokl.
AN SSSR 147 no. 6:1365-1368 D '62. (MIRA 16:1)

1. Institut elementoorganicheskikh soyedineniy AN SSSR i
Moskovskiy khimiko-tehnologicheskiy institut im. D. I.
Mendeleyeva. 2. Chlen-korrespondent AN SSSR (for Korshak).

(Ethers) (Polyamides)

KOLESNIKOV, G.S., otv. red.; ANDRIANOV, K.A., red.; DOGADKIN, B.A., red.; DOLGOPLOSK, B.A., red.; YENIKOLOPYAN, N.S., red.; KARGIN, V.A., red.; KOZLOV, P.V., red.; KOROTKOV, A.A., red.; KORSHAK, V.V., red.; LAZURKIN, Yu.S., red.; MEDVEDEV, S.S., red.; MIKHAYLOV, N.V., red.; PASYNSKIY, A.G., red.; SLONIMSKIY, G.L., red.; SMIRNOV, V.S., red.; TSVETKOV, V.N., red.; FREYMAN-KRUPENSKIY, D.A., tekhn. red.

[Heterochain high-molecular weight compounds] Geterotseprnye vysokomolekuliarnye soedineniia; sbornik statei. Moskva, Izd-vo "Nauka," 1963. 246 p. (MIRA 17:3)

KOLESNIKOV, G.S., otv. red.; ANDRIANOV, K.A., red.; DOGADKIN, B.A., red.; DOLGOPLOSK, B.A., red.; YENIKOLOPYAN, N.S., red.; KARGIN, V.A., red.; KOZLOV, P.V., red.; KOROTKOV, A.A., red.; KORSHAK, V.V., red.; LAZURKIN, Yu.S., red.; MEDVEDEV, S.S., red.; MIKHAYLOV, N.V., red.; PASYNSKIY, A.G., red.; SLONIMSKIY, G.L., red.; SMIRNOV, V.S., red.; TSVETKOV, V.N., red.; FREYMAN-KRUPENSKIY, K.A., tekhn. red.

[Carbochain high-molecular weight compounds] Karbotsepnye vysokomolekuliarnye soedineniya; sbornik statei. Moskva, Izd-vo AN SSSR, 1963. 287 p. (MIRA 17:1)

RAFIKOV, Sagid Raufovich; PAVLOVA, Sil'viya Aleksandrovna;
TVERDOKHLEBOVA, Iraida Ivanovna; ~~KORSHAK, V.V.~~ otv. red.;
LOSKUTOVA, I.P., red.; DOROKHINA, I.N., tekhn. red.

[Methods for determining the molecular weights and polydispersity of macromolecular compounds] Metody opredeleniya molekularnykh vesov i polidispersnosti vysokomolekularnykh soedinenii. Moskva, Izd-vo AN SSSR, 1963.

334 p.

(MIRA 16:10)

(Macromolecular compounds) (Colloids) (Molecular weights)

KOZLOV, P.V., otv. red.; ANDRIANOV, K.A., red.; DOGADKIN, B.A., red.;
DOLGOPLOSK, V.A., red.; YENIKOLOPYAN, N.S., red.; KARGIN,
V.A., red.; KOLESNIKOV, G.S., red.; KOROTKOV, A.A., red.;
KORSHAK, V.V., red.; LAZURKIN, Yu.S., red.; MEDVEDEV, S.S.,
red.; MIKHAYLOV, N.V., red.; PASYNSKIY, A.G., red.;
SLONIMSKIY, G.L., red.; SMIRNOV, V.S., red.; TSVETKOV, V.N.,
red.; FREYMAN-KRUPENSKIY, D.A., tekhn. red.

[Adhesion of polymers] Adgeziia polimerov; sbornik statei.
Moskva, Izd-vo AN SSSR, 1963. 142 p. (MIRA 16:10)
(Polymers) (Adhesion)

KORSHAK, V.V.; VINOGRADOVA, S.V.; VALETSKIY, P.M.; DEBORIN, M.G.

Synthesis of homogeneous and mixed polyarylates from
allyl-substituted phenols. Lakokras.mat.i ikh prim.
no.1:3-9 '63. (MIRA 16:2)

1. Institut eksperimental'noy optiki i spektroskopii
AN SSSR i Moskovskiy khimiko-tehnicheskiy institut imeni
D.I. Mendeleyeva.
(Phenols) (Arylation)

ACCESSION NR: AT4033981

S/0000/63/000/000/0024/0028

AUTHOR: Korshak, V. V.; Kogan, A. N.; Sergeyev, V. A.; Shleyfman, R. B.; Gurevich, L. B.; Andion, G. B.

TITLE: The rapid low-temperature alkaline polymerization of Epsilon-caprolactam

SOURCE: Geterotseplnye vysokomolekulyarnye soyedineniya (Heterochain macromolecular compounds); sbornik statey. Moscow, Izd-vo "Nauka," 1963, 24-28

TOPIC TAGS: polymerization, caprolite, capron, low temperature polymerization, alkaline polymerization, caprolactam

ABSTRACT: Influenced by the recent work of Wichterle on a method for the production of high-quality poly- ϵ -caproamide (Capron), the authors studied the peculiarities of rapid low-temperature polymerization and the properties of the polymeric products with the aim of producing pure and admixed compositions suitable as raw material for large pieces. The polymerization of ϵ -caprolactam was carried out with equimolar ratios of the sodium salt of caprolactam and N-acetylcaprolactam as a catalytic system. Samples measuring 35 x 6 x 4mm were used in tests for static

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ACCESSION NR: AT4033981

bend ultimate strength, specific impact toughness and moisture absorption, and 6 x 6 x 4mm samples were used in tests for compressible ultimate strength. The best physical-mechanical properties were obtained with a ratio of 0.3 : 0.3 mol%. The poly- ϵ -caproamide produced (caprolite) was greatly superior to the "B" brand cast capron. The methods of pre-desiccation of the ϵ -caprolactam were found to have no influence on the course of polymerization and properties of the product. The connection between the molecular weight and the physical-mechanical properties of caprolite were also studied using N,N'-isophthaloyl- and N,N'-terephthaloyl-bis-caprolactams, and N,N'-isophthaloyl- and N,N'-terephthaloyl-bis-piperidones to enlarge the chain, which proved to be effective co-catalysts in the process. It is concluded that the physical-mechanical properties of caprolite are independent of the molecular weight (within the 16700-72000 range) but are dependent on the content of low-molecular water-soluble substances. Orig. art. has: 2 tables, 1 figure and 1 chemical formula.

ASSOCIATION: Institut elementoorganicheskikh soyedinenii AN SSSR (Institute of Organometallic Compounds, AN SSSR)

Card 2/3

KORSHAK, V.V.; KIRKINA, L.I.; MOZGOVA, K.K.; YEGOROVA, Yu.V.

Change of the mold resistance of graft copolymers of wool
and silk. Khim. volok. no.4:28-29 '63. (MIRA 16:8)

1. Institut elementoorganicheskikh soyedineniy.

ACCESSION NR: AT4033994

S/0000/63/000/000/0117/0122

AUTHOR: Korshak, V. V.; Gribova, I. A.; Andreyeva, M. A.; Kabachnik, M. I.; Medved', T. Ya.

TITLE: Polymers containing phosphorus. XXIX. Heterocyclic polyesters of vinylphosphinic acid and some glycols

SOURCE: Geterotseptye vy*sokomolekulyarnye soyedineniya (Heterochain macro-molecular compounds); sbornik statey. Moscow, Izd-vo "Nauka," 1963, 117-122

TOPIC TAGS: vinylphosphinic acid, ethylene glycol, propylene glycol, diethylene glycol, trimethylene glycol, butylene glycol, polymer, cyclic polyester, polymerization, polymerization catalyst, metallic sodium, linear polymerization, radical polymerization, benzoyl peroxide, tert.-butyl peroxide, tert.-butyl hydroperoxide

ABSTRACT: The authors synthesized the cyclic esters of vinylphosphinic acid (I) and ethylene glycol (II), 1,2-propylene glycol (III), trimethylene glycol (IV), 1,4-butylene glycol (V) or diethylene glycol (VI) and determined some of their physicochemical properties (see Table 1 in the Enclosure). These esters were then polymerized linearly in the presence of water (3% by weight, 140C, from 15 hours for III to 83 hours for VI).

Card 1/3

ACCESSION NR: AT4033994

Yields ranged from 23.2% for VI to 88.6% for II, indicating that penta-cyclic esters are the most suitable. Structural modification of the synthesized polyesters was then attempted by the use of radical polymerization catalysts (benzoyl peroxide, tert.-butyl peroxide, tert.-butyl hydroperoxide and metallic Na; 0.5 to 3.0% by weight, 55-90C, 10-51 hours). The polymers obtained were solids or similar to factice rubber with softening temperatures of 180-250C. "G. M. Popova and G. F. Dmitriyeva took part in the experimental part of the work." Orig. art. has: 2 graphs, 4 tables and 1 chemical equation.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR (Institute of Metalloorganic Compounds AN SSSR)

SUBMITTED: 31Jul62

DATE ACQ: 30Apr64

ENCL: 01

SUB CODE: OC

NO REF Sov: 005

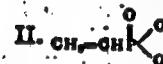
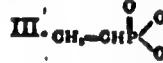
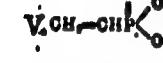
OTHER: 000

Card 2/3

ACCESSION NR: AT4033994 - Cyclic esters of vinylphosphinic acid

ENCLOSURE: 01

TABLE 1

Chemical formula	B.P., °C/mm	20 n_D	20 d_4	MR, D		C, %		H, %		P, %		Yield %
				Found	Calcu- lated	Found	Calcu- lated	Found	Calcu- lated	Found	Calcu- lated	
I. 	127/6	1.4701	1.3098	28.63	28.57	35.5	35.5	5.8	5.8	20.6	20.6	23.1* 63
II. 	113-114/3	1.4598	1.3071	23.59	23.49	40.8	40.7	6.2	6.2	20.4	20.5	20.9 50
III. 	120-130/2	1.4775	1.3570	23.32	23.49	40.8	40.5	6.4	6.3	20.4	20.4	20.9 53
IV. 	120/3	1.4712	1.3044	30.19	28.11	44.6	44.6	7.0	7.0	6.9	6.9	47
V. 	T. MM.	-	-	-	-	40.4	40.4	6.2	6.2	17.5	17.4	17.4 10

Card 3/3

S/190/63/005/002/002/024
B101/B102

AUTHORS: Korshak, V. V., Mosgova, K. K., Shkolina, M. A.,
Nagdaseva, I. P., Berestnev, V. A.

TITLE: Synthesis of graft copolymers. XII

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 5, no. 2, 1963,
171-175

TEXT: Tests are discussed in reference to the grafting of acrylic and methacrylic acids onto caprone fiber at room temperature and the stabilization of the graft copolymer by metal salts. Commercial caprone threads with Schopper strength 14.3 kg were heated at 80-120°C and then immersed for a short time in anhydrous acrylic or methacrylic acid at room temperature. This mild treatment, chosen because of the sensitivity of the polyamide to acids, yielded only a thin microfilm on the fiber, so the grafting could not be determined from the increase in weight of the fiber. In the threads of graft copolymer, the strength was considerably reduced after 100 hrs heating at 150°C; the highest value was 38% residual strength. Treatment of the threads of graft copolymers for several hours with 2.5-5%

Card 1/2

S/190/63/005/003/007/024
B101/B106

AUTHORS: Korshak, V. V., Mozgova, K. K., Shkolina, M. A., Uzina, R. V.,
Ionova, T. V.

TITLE: Synthesis of graft polymers. XIII

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 5, no. 3, 1963, 338-341

TEXT: In order to achieve better adhesion between rubber and cord, grafts were made of fiber polymers on viscose or caprone fibers. For this purpose the fiber was either treated with ozone for 10 to 300 min or was heated to 90 - 110°C for 1 - 5 min. Subsequently they were treated with carboxyl containing divinyl latex, divinyl methylvinylpyridine latex, divinyl acrylonitrile latex or with styrene, methylmethacrylate, acrylic or methacrylic acids, 2-methyl-5-vinyl-pyridine or mixtures of these monomers. With acrylonitrile, acrylic or methacrylic acids the homopolymers developed so rapidly that no grafted polymers were obtained. Grafting was achieved by changing the temperature conditions or by using mixtures. Thus an addition of styrene had a strongly inhibiting effect on the formation of acrylonitrile homopolymers. As an example, the increase in strength of the bond between natural rubber and polyamide fiber is mentioned which is due to

Card 1/2

Synthesis of graft polymers. XIII

S/190/63/005/003/007/024
B101/B186

grafting of methylvinylpyridine copolymer onto the fiber. The bond strength of the non-grafted fiber was 0.7 kg/cm. After a 40-hr grafting of the fiber with 2-methyl-5-vinylpyridine it increased to 0.87, after 5 hr grafting with the same compound it increased to 0.94, and after impregnation of the fiber with divinyl-2-methyl-5-vinyl pyridine-latex to 1.5 kg/cm. The unfavorable effect of excessively long grafting is explained by the formation of an excessively branched surface layer, thus covering the major part of the nitrogen atoms of the pyridine rings so that they cannot interact with the rubber-fiber interface. There are 4 tables.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR (Institute of Elemental Organic Compounds AS USSR)

SUBMITTED: August 5, 1961

Card 2/2

S/190/63/005/003/010/024
B101/B186

AUTHORS: Polyakova, A. M., Sakharova, A. A., Chernyshev, Ye. A.,
Krasnova, T. L., Korshak, V. V., Petrov, A. D.

TITLE: Investigation into the polymerization of organometallic
styrene derivatives

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 5, no. 3, 1963, 351 -356

TEXT: Polymerization was made of $p\text{-R}_3\text{M}^{\text{IV}}\text{C}_6\text{H}_4\text{CH-CH}_2$, where $\text{R} = \text{CH}_3$ or C_2H_5 ,
 M^{IV} = Si, Sn or Ge with or without pressure at 80°C in the presence of azo-
isobutyric dinitrile. Results:

monomer	pressure atm	time hr	yield %	$[\eta]$ 100 ml/g
$(\text{CH}_3)_3\text{SnC}_6\text{H}_4\text{CH-CH}_2$	6000	6	72	5.15
ditto		1	10	68
$(\text{C}_2\text{H}_5)_3\text{SnC}_6\text{H}_4\text{CH-CH}_2$	6000	6	60	2.10
ditto		1	10	53
$(\text{C}_2\text{H}_5)_3\text{GeC}_6\text{H}_4\text{CH-CH}_2$	6000	6	~100	insoluble
ditto		1	10	77
$(\text{C}_2\text{H}_5)_3\text{SiC}_6\text{H}_4\text{CH-CH}_2$	6000	6	~100	insoluble
ditto		1	10	82

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S/190/63/005/003/010/024

B101/B186

Investigation into the polymerization...

The thermomechanical curves of all polymers synthetized without pressure are similar. The zinc-containing polymer synthetized under pressure differed from the other Si and Ge polymers, also synthetized under pressure, by a step in the thermomechanical curve between 150 and 300°C. p-triethyl-stannylo- α -methylstyrene polymerized under pressure behaves in the same way. This is due to the C-Sn bond which, compared with C-Si and C-Ge, is less stable. X-ray analysis showed that the silyl and germyl compounds have amorphous structure, the stannylo compound, however, has had a quasi-crystalline structure. The IR spectra of all compounds have no absorption bands of the vinyl group so that polymerization is due to the rupture of the C-C bond of the vinyl group. In crude state, all polymers are transparent, glassy substances or viscous masses, after reprecipitation from benzene or xylene they are colorless fibrous substances. There are 1 figure and 1 table.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR (Institute of Elemental Organic Compounds AS USSR); Institut organicheskoy khimii im. N. D. Zelinskogo AN SSSR (Institute of Organic Chemistry imeni N. D. Zelinskogo ASUSSR)

SUBMITTED: August 9, 1961
Card 2/2

S/190/63/005/004/004/020
B101/B220

AUTHORS: Sosin, S. L., Korshak, V. V.

TITLE: Polybenzylidene benzoate and polybenzylidene alcohol

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 5, no. 4, 1963, 499-505

TEXT: Previously (Dokl. AN SSSR, 132, 360, 1960) polybenzylidene benzoate, $[C_6H_5-COO-C-C_6H_5]_n$, was obtained by bringing benzyl benzoate into reaction with tert-butyl peroxide. In this paper the conditions of the synthesis were studied more thoroughly and the polymer was converted to polybenzylidene alcohol. The dependence of yield and molecular weight on the initiator/monomer ratio was determined and a maximum m.w. of ~ 540,000 was obtained with 2.35 mole peroxide per mole benzyl benzoate. Compounds obtained from the low-molecular reaction products by treatment with acetic acid and precipitation with methanol: diphenyl ethylene glycol dibenzoate which is an intermediary polymerization product, a low-molecular polymer fraction (m.w. 600 - 800), and a mixture of methyl-phenyl carbinol benzoate and α -methyl hydro benzoin dibenzoate. Therefrom it is concluded that a small number of side reactions also occur with the methyl groups formed on de-

Card 1/4

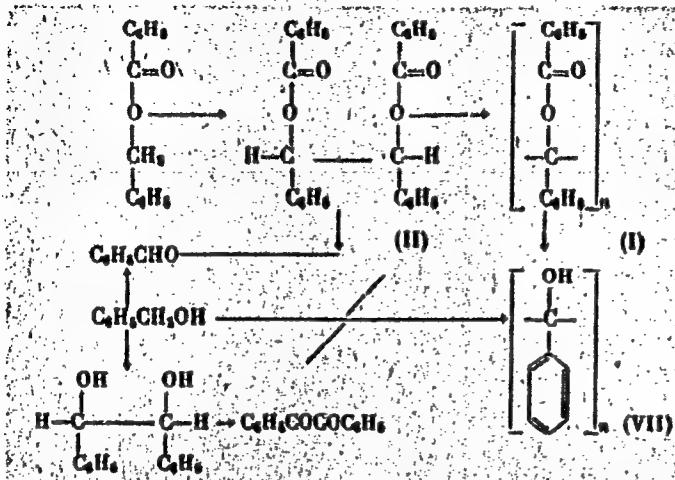
S/190/63/005/004/004/020
B101/B220

Polybenzylidene benzoate and ...

composition of tert-butyl peroxide. When polybenzylidene benzoate dissolved in tetrahydrofuran is treated at 27 - 30°C for 1 hr with LiAlH₄ there is a formation of polybenzylidene alcohol, $[C_6H_5-C(OH)]_n$ which is a white powder, not previously described, m.w. 37,000, m.p. 125 - 130°C, easily soluble in alcohols and other organic solvents but insoluble in benzene. The structure was identified from the 3200 - 3400 cm⁻¹ band of the IR spectrum (OH band). Direct polymerization of benzylidene alcohol does not yield polybenzylidene alcohol but polybenzylidene benzoate which is obtainable also from benzaldehyde. Hence, the following reaction scheme is suggested:

Card 2/4

Polybenzylidene benzoate and ...

S/190/63/005/004/004/020
B10/B220

Card 3/4

S/190/63/005/004/004/020
B101/B220

Polybenzylidene benzoate and ...

There are 3 figures and 1 table.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR
(Institute of Elemental Organic Compounds AS USSR)

SUBMITTED: September 13, 1961

Card 4/4

L 11089-63
PC-4/PT-4-HM/HW/MAY
ACCESSION NR: AP3C00691

EPR/EWP(j)/EPP(c)/EWT(l)/EWT(m)/BDS--ASD/ESD-3--Ps-4/

S/0190/63/005/005/0663/0669 77

76

AUTHOR: Korshak, V. V.; Sosin, S. L.; Alekseyeva, V. P.; Morozova, Ye. M.

TITLE: Investigation of the structure of a polymer prepared by the polyrecombination of benzyl trifluoroacetate

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 5, 1963, 663-669

TOPIC TAGS: polyrecombination, polymer, benzyl trifluoroacetate, electron paramagnetic resonance

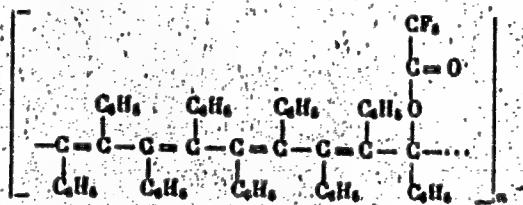
ABSTRACT: The structure properties of a polymer prepared by the polyrecombination of benzyl trifluoroacetate have been studied at the Institute of Organoelemental Compounds, AN SSSR by IR and EPR spectroscopy and by the method of thermo-mechanical curves. The polymer was synthesized at 170°C in the presence of tert-butyl peroxide by a previously described method (V. V. Korshak, S. L. Sosin, M. V. Chistyakov, Uspekhi khimii i tekhnologii polimerov, Goskhimizdat, 1960, p. 45), and the reaction products were isolated and analyzed. Study of the thermomechanical curves indicate that the polymer exhibits elastic properties at 220 to 550°C. As the peroxide/monomer ratio is varied from 2.15 to 3.05/l, the polymer yield varies from 7.05 to 31.4% on the reacted monomer, the mol. wt. from 1020 to 22,000, and the softening point from 198 to 580°C. The EPR spectrum of

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L 11089-63

ACCESSION NR: AP3000691

polymer showed a narrow ($\delta H = 5$ oe) and intense signal, indicating the presence of unpaired electrons. Emission of the EPR signal by both the solid polymer and its benzene solutions showed that electrons are delocalized within the polymer molecules. The assumption that the EPR spectrum is due to the presence of conjugated double bonds is confirmed by the IR spectra. The IR spectrum also indicates that in the polymer, as in the monomer, the fluorine is found in the ester groups. These spectroscopic data and elemental analysis of the polymer suggest that it has the following structure:



where every 7th or 9th C atom has a trifluoroacetate substituent. This structure is probably formed by the splitting off of most of the trifluoroacetate groups.

Card 2/3

L 11089-63

ACCESSION NR: AP3000691

in the polyrecombination; these are unstable and undergo further decomposition.
Orig. art. has: 3 figures, 4 formulas, and 1 table.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR (Institute of Organoelemental Compounds, AN SSSR)

SUBMITTED: 09Oct61

DATE ACQ: 17Jun63

ENCL: 00

SUB CODE: CH, MA

NO REF Sov: 007

OTHER: 006

mcs/wm
Card 3/3

L 13548-63

EWP(j)/EMT(m)/BDS ASD PC-4 RM

ACCESSION NR: AP5000695

8/0190/63/005/005/0674/0660

62

58

AUTHOR: Korshak, V. V.; Vinogradova, S. V.; Lebedeva, A. S.

TITLE: Heterochain polyesters. 41. Interfacial synthesis of mixed polyarylates

SOURCE: Vyssokomolekulyarnye soyedineniya, v. 5, no. 5, 1963, 674-680

TOPIC TAGS: interfacial synthesis, interfacial condensation, polyesters, polyarylates, diane, adipyl chloride, sebacyl chloride, terephthalyl chloride

ABSTRACT: The study involved the formation of mixed polyarylates by interfacial polycondensation, based on the interaction of diane(*n,n'*-dioxypyhenyl-2,2-propane) and sebacyl-, adipyl-, terephthalyl-, and isophthalyl chlorides. The procedure consisted of adding to an alkaline 0.1m diane solution a 0.1m solution of the corresponding chlorides in an organic solvent. It was found that by using the chlorides of sebacyl and terephthalyl the solubility of the obtained polymers in *n*-xylene decreased with an increase of terephthalyl chloride. In comparing the infrared spectra of the obtained polymer with those of the diane-sebacyl and diane-terephthalyl polyarylates, the polymer proved to be of mixed nature. Studies of its softening behavior on heating, as well as of its solubility behavior pattern in *n*-xylene revealed its nonhomogeneous nature. This was confirmed by x-ray investigations which suggested an intermediate crystalline-amorphous structure. The

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L 13548-63

ACCESSION NR: AB3000693

reactivity of the respective chlorides was shown to play an important role in the formation of the polyarylates, adipyl chloride heading the list. Thanks for the optical and x-ray determinations are given to the workers of the Institute of Organoelemental Compounds, Academy of Sciences SSSR, headed by I. V. Obreimov and A. I. Kitaygorodskiy. L. D. Reshetnikova participated in the experimental work. Orig. art. has: 1 figure and 3 tables.

ASSOCIATION: Institut elementoorganicheskikh soyadineniy AN SSSR (Institute of Organoelemental Compounds, Academy of Sciences SSSR)

SUBMITTED: 12Oct61

DATE ACQ: 17Jun63

ENCL: 00

SUB CODE: CH

NO REF Sov: 007

OTHER: 000

Card 2/2

L 18044-63

EWP(j)/EPF(c)/EWT(m)/BDS ASD: PC-4/PR-4 RM/NW/MAT

S/0190/63/005/006/0793/0798

ACCESSION NR: AP3001145

10
69

AUTHORS: Korshak, V. V.; Sladkov, A. M.; Kudryavtsev, Yu. P.

TITLE: Oxidative dehydropolycondensation of p-diethinylbenzene

SOURCE: Vysokomolekulyarnye soyedineniya, v. 5, no. 6, 1963, 793-798

TOPIC TAGS: oxidative condensation, copolycondensation, dehydropolycondensation, diethinylbenzene, acetylene

ABSTRACT: Earlier studies by the authors on dehydropolycondensation of p-diethinylbenzene by oxidation with potassium ferricyanide in the presence of cuprous chloride induced the present investigation, where oxygen of the air, hydrogen peroxide, and ammonium persulfate were added to the list of oxidizers. For copolymerization studies, acetylene, phenylacetylene, and ethylacetylene were used in conjunction with p-diethinylbenzene. The oxidative dehydropolycondensation of p-diethinylbenzene by air was conducted in a pyridine solution in the presence of cuprous chloride, through which air was bubbled for 1.5 hours, resulting in the formation of a yellow precipitate. The obtained substance was subjected to elementary analysis and to infrared spectroscopy, which showed

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L 18044-63

ACCESSION NR: AP3001145

absorption bands in the 3300 and 1250 cm^{-1} regions, which are characteristic for $\equiv\text{C-H}$ bonds, while the 2200 cm^{-1} band is indicative of the $\text{C}\equiv\text{C}$ bond. The appearance of other characteristic bands indicated the presence of phenyl nuclei along the polymeric chain. The oxidative copolymerization of diethinylbenzene with acetylene, phenylacetylene and ethylacetylene yielded low molecular ether-soluble compounds with the first two instances, and an insoluble product with ethylacetylene. Orig. art. has: 4 formulas and 5 charts.

ASSOCIATION: Institut elementoorganicheskikh soedineniy AN SSSR (Institute of Elementoorganic Compounds, Academy of Sciences, SSSR)

SUBMITTED: 14Oct61

DATE ACQ: 01Jul63

ENCL: 00

SUB CODE: CH

NO REF Sov: 003

OTHER: 002

Card 2/2

L 13517-63

EPF(c)/EWP(1)/EWT(m)/BDS

ASD

PF-4/Pc-4

RM/MAT/WW

ACCESSION NR: AP3001146

S/0190/63/005/006/0799/0804

70

68

AUTHOR: Iskenderov, M. A.; Korshak, V. V.; Vinogradova, S. V.; Kharlamov, V. V.TITLE: Heterochain polyesters. 42. Mixed polyarylates based on dihydroxynaphthalenesSOURCE: Vysokomolekulyarnye soyedineniya, v. 5, no. 6, 1963, 799-804TOPIC TAGS: Polyester, heterochain compound, polyarylate, dihydroxynaphthalene, dian

ABSTRACT: The synthesis of mixed polyarylates was accomplished by polycondensation of 10 isomers of dihydroxynaphthalene, dian, and the chlorides of terephthalic, isophthalic, adipic and sebacic acids in ditolylmethane, at temperatures ranging from 100 to 220°C for periods of 1 to 12 hours. The polyarylates obtained on the basis of terephthalic acid were mostly of mixed crystalline-amorphous structure and had softening points from 500-130°C, the highest belonging to the 1,3-isomer. Where isophthalic acid was the base, the softening point had a range of 400-25°C, and it showed a still lower range of 190-5°C with adipic acid, going still further down with sebacic acid, ranging from 35°C to -18°C. Thus it seems that increasing the number of methylene groups in the aliphatic dicarboxylic acids from 4 to 8 causes

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L 13517-63
ACCESSION NR: AP3001146

2
a marked drop in the softening-point temperature, which was also found to be accompanied by a higher solubility and a lower crystallizability of these polymers. Thanks are given to the co-workers of the laboratory of the Institute of the Elementoorganic Compounds, of the Academy of Sciences SSSR, headed by A. I. Kitaygorodskiy, for conducting the x-ray structural investigation of the polymers.

Orig. art. has: 5 tables.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR (Institute of Elementoorganic Compounds, Academy of Sciences SSSR)

SUBMITTED: 01Nov61

DATE ACQ: 01Jul63

ENCL: 00

SUB CODE: 00

NO REF SOV: 005

OTHER: 000

Card 2/2

ACCESSION NR: AP3000128

S/0062/63/000/005/0912/0921

AUTHOR: Korshak, V. V.; Rogozhin, S. V.; Sidorov, T. A.; Chou Jun-P'ei; Komarova, L. I.

TITLE: Synthesis and the structure of polymeric compounds from saturated aromatic alkyl compounds

SOURCE: AN SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 5, 1963, 912-921

TOPIC TAGS: aromatic alkyl polymer preparation, ethylbenzene, cumol, p-cymol intermediates, di-isopropylbenzene intermediates

ABSTRACT: A useful and practical laboratory method has been developed for the preparation of alkylaromatic compounds by means of pyrolysis. The apparatus is constructed in such a way that the reaction can be controlled and the reaction results can be reproduced (see Figure 1, Enclosure 1). The maximum yield of polymeric products is reached when the temperature of a platinum wire traversing the length of the apparatus is heated to 750-800°C at a constant time. Meanwhile, the quantity of gaseous products and oligomers sharply increase with the increase of temperature. At optimum conditions, the polymer yield is 40% of the total. The obtained polymers are hard colorless compounds which soften at a temperature of

Card 1/3

ACCESSION NR: AP3000128

50-90C, which are easily soluble in original starting materials, and which have molecular weights ranging from 2000 to 6000. The intermediates used for the synthesis of these polymeric compounds were ethylbenzene, cumol, p-cymol, and di-isopropylbenzene. Their structures were confirmed by infrared spectroscopy. An explanation is given to some reaction features of polydihydrocondensation. Orig. art. has: 2 tables, 4 graphs, 1 fig. and some structural forms.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR
(Institute of Organometallic Compounds, Academy of Sciences SSSR)

SUBMITTED: 29Jun62

DATE ACQ: 12Jun63

ENCL: 01

SUB CODE: CH

NO REF Sov: 004

OTHER: 008

Card 2/3

ACCESSION NR: AP3000128

ENCLOSURE: 1

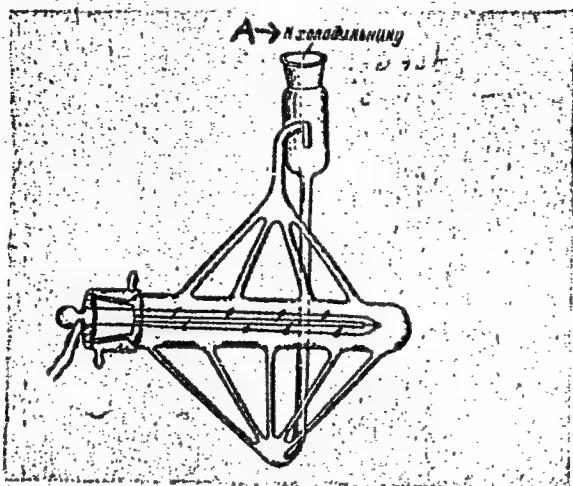


Fig. 1. Apparatus for the preparation of polymers by polyhydro-condensation. A - to condenser

Card 3/3

L 13585-63
Pr-4 JAJ/RM/WW
ACCESSION NR: AP3003784

FCS(f)/EWP(j)/EWT(m)/EPF(c)/BDS AFFTC/ASD PC-4/

S/0190/63/005/007/0969/0975

AUTHOR: Korshak, V. V.; Vinogradova, S. V.; Wu, Peng-yuan

TITLE: Heterochain polymers. 43. Preparation of phosphorus-containing poly(amide esters) by interfacial polycondensation

SOURCE: Vy*okomolekulyarnye soyedineniya, v. 5, no. 7, 1963, 969-975

TOPIC TAGS: poly(amide ester), 4,4'-(methylphosphinylidene)dibenzoic acid, 4,4'-(methylphosphinylidene)dibenzoic acid-based poly(amide esters), 4,4-(methylphosphinylidene)dibenzoyl chloride, 4,4'-isopropylidenediphenol, 1,6-hexanediamine, poly(amide ester) synthesis, interfacial polycondensation, equilibrium polycondensation, thermomechanical curve, poly(amide ester) thermomechanical curve

ABSTRACT: 4,4'-(Methylphosphinylidene) dibenzoic acid-based poly(amide esters) have been synthesized for the first time by interfacial polycondensation of 4,4'-(methylphosphinylidene)dibenzoyl chloride (I), 4,4'-isopropylidenediphenol (II), and 1,6-hexanediamine (III). The reaction was conducted in 0.5 N chloroform solution with vigorous agitation. The poly(amide esters) were produced in yields of 56.5 to 81.8% depending on the I/II/III ratio, which varied from 1/1/0 to 1/0/1. The formation of copolymers (rather than of a mixture of homopolymers)

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L 13585-63

ACCESSION NR: AP3003784

2

was ascertained by chemical solubility, IR-spectroscopic, and thermomechanical methods. The structure of the poly(amide esters) was heterogeneous, but approached that calculated from the monomer ratios. III was more reactive with I than with II. The poly(amide esters), depending on the initial monomer mixture composition, are either white, transparent, or semitransparent amorphous powders with softening temperatures of 165 to 253°C. Their solubility in such solvents as benzene, chloroform, dioxane, and tetrahydrofuran is low. They dissolve more readily in tetrachloroethylene. Their low molecular weight (as indicated by reduced viscosity) can be increased by conducting the reaction in the presence of mercosolat emulsifier. Poly(amide esters) were also synthesized by equilibrium polycondensation, in which case the products are transparent, slightly colored resins having a lower molecular weight than the poly(amide esters) prepared by interfacial polycondensation. Orig. art. has: 3 figures and 4 tables.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR (Institute of Organoelemental Compounds, AN SSSR)

SUBMITTED: 27Nov61

DATE ACQ: 08Aug63

ENCL: 00

SUB CODE: CH

NO REF Sov: 002

OTHER: 000

Card 2/2

L 13716-63

EWP(j)/BIS/ENT(m) ASD Pe-4 RM

ACCESSION NR: AP3003786

8/0190/63/005/007/0979/0985

AUTHOR: Korshak, V. V.; Frunze, T. M.; Kurashev, V. V.; Kotrelev, G. V.

62

61

TITLE: Heterochain polyamides. 34. Synthesis of polyamides with active functional groups in macromolecules

SOURCE: Vy'sokomolekulyarnye soyedineniya, v. 5, no. 7, 1963, 979-985

TOPIC TAGS: polyamides, polycondensation, interfacial polycondensation, macromolecules, functional groups

ABSTRACT: Studies were conducted on the polycondensation reaction of 1,3-diaminopropane-2-ol (DAPO) with sebadic acid as well as with sebacyl and terephthalyl chlorides. The polyamide obtained by heating a mixture of DAPO with sebadic acid for one hour at not over 200°C yielded a product of low molecular weight. Any further increase in temperature or heating time resulted in the formation of a tridimensional, non fusible, brittle mass, soluble only in sulfuric acid. On the other hand, interfacial polycondensation of DAPO with sebacyl or terephthalyl chlorides in a water-benzene system produced cresol-soluble polymers of substantially higher viscosity, the optimum concentration

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L 13716-63

ACCESSION NR: AP3003786

of DAPO being 0.25 Molar. An excess of DAPO is needed, since it acts as an acceptor for the hydrogen chloride formed during the reaction. The optimal yield of the polymer amounted to 80%, as against 65% where sodium hydroxide was used as acceptor. Mixed polyamides were produced by reacting DAPO with sebacyl chloride and hexamethylenediamine. Here, too, the use of sodium hydroxide resulted in products of a higher melting point and lower solubility. Orig. art. has: 6 diagrams and 3 tables.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR (Institute of Elementoorganic Compounds, AS USSR)

SUBMITTED: 06Dec61

DATE ACQ: 08Aug63

ENCL: 00

SUB CODE: 00

NO REF Sov: 005

OTHER: 001

Card 2/2

L 14531-63 EPR/EPF(c)/EWP(j)/EWT(m)/BDS/ES(s)-2 AFFTC/ASD/SSD Pa-4/Pr-4/

Pc-4/Pt-4 RM/WW/MAY

ACCESSION NR: AP3004698

S/0190/63/005/008/1127/1129 83

81

AUTHOR: Korshak, V. V.; Zamyatina, V. A.; Chursina, L. M.; Bekasova, N. I.TITLE: Polycondensation of 2,4,6-trichloroborazine with difunctional compounds

SOURCE: Vyssokomolekulyarnye soyedineniya, v. 5, no. 8, 1963, 1127-1129

TOPIC TAGS: methylphosphinylpolyborazine, tetramethyldisiloxypolyborazine, 2,4,6-trichloroborazine, dibutyl methylphosphonate, 1,3-dibutoxy-1,1,3,3-tetramethyldisiloxane, dimethyl sebacate, 2,4,6-trichloroborazine-dibutyl methylphosphonate copolymer, 2,4,6-trichloroborazine-1,3-dibutoxy-1,1,3,3-tetramethyl-disiloxane copolymer, 2,4,6-trichloroborazine-dimethyl sebacate copolymer, polycondensation

ABSTRACT: Heat-resistant high-melting insoluble copolymers have been synthesized by polycondensation (at 100° under nitrogen, then at 240°C and 2 mm Hg) of 2,4,6-trichloroborazine (I) with dibutyl methylphosphonate (II), 1,3-dibutoxy-1,1,3,3-tetramethyldisiloxane (III), or dimethyl sebacate (IV). Compounds I and II yield a powdery yellow copolymer which is insoluble in the common organic solvents, melts above 300°C, and has a reduced viscosity in cresol of 0.19 [concentration unspecified]. The copolymer is slowly hydrolyzed by air moisture and

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L 14531-63

ACCESSION NR: AP3004698

cold water. The formula (1) of the copolymer is given in the Enclosure; according to elemental-analysis data, $n = 7$. Compounds I and III yield a brittle dark-brown copolymer melting above 300°C and with a reduced viscosity in cresol of 0.16 [concentration unspecified]. The copolymer is insoluble in the common solvents and is stable to air moisture; its formula (2), determined by elemental analysis, is given in the Enclosure. Interaction of I and IV results in thermal degradation in addition to polycondensation and yields a copolymer with an increased ash content. The copolymer melts above 300°C and has a reduced viscosity of 0.2 [solvent and concentration unspecified]. Orig. art. has: 2 formulas.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR (Institute of Organoelemental Compounds, AN SSSR)

SUBMITTED: 07Dec61

DATE ACQ: 28Aug63

ENCL: 02

SUB CODE: CR, MA

NO REF Sov: 000

OTHER: 002

Card 2/A2

KORSHAK, V.V.; FRUNZE, T.M.; PAVLOVA, S.A.; KURASHEV, V.V.

Heterochain polyamides. Part 35: Change in the rate of interfacial condensation and of fractional composition of polyhexamethyleneadipamide. Vysokom. soed. 5 no.8:1130-1134 Ag '63. (MIRA 16:9)

1. Institut elementoorganicheskikh soyedineniy AN SSSR,
(Adipamide) (Polymerization)

L 18184-63 EWP(j)/EPF(c)/EWT(m)/BDS ASD Pe-4/Pr-4 RM/MAY/HW
ACCESSION NR: AP3006746 S/0190/63/005/009/1284/1287 70
1287 15

AUTHOR: Korshak, V. V.; Sladkov, A. M.; Luneva, L. K.; Girshovich, A. S.

TITLE: Synthesis and study of polymers containing allyloxytitanocene

SOURCE: Vy*skomolekulyarny*ye soyedineniya, v. 5, no. 9, 1963,
1284-1287

TOPIC TAGS: titanium compounds, titanocene, dicyclopentadienyl-titanium(IV) dichloride, allyl alcohol, allyloxytitanocene, allyloxydicyclopentadienyltitanium(IV) chloride, synthesis, polymerization, polymer, dicyclopentadienyltitanium(IV) dichloride, trimer, styrene, methyl methacrylate, copolymerization, copolymer, allyloxydicyclopentadienyltitanium(IV), polymer with styrene, styrene, polymer with allyloxydicyclopentadienyltitanium, allyloxy-dicyclopentadienyltitanium(IV), polymer with methyl methacrylate, methyl methacrylate, polymer with allyloxydicyclopentadienyltitanium, copolymer structure, copolymer property

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ACCESSION NR: AP3006746

ABSTRACT: The synthesis of allyloxytitanocene [allyloxydicyclopentadienyltitanium chloride] (I) and its polymerization and copolymerization with styrene or methyl methacrylate have been studied. After an unsuccessful attempt to synthesize bis allyloxytitanocene [bis(allyloxy)dicyclopentadienyltitanium] from 1 mol titanocene [dicyclopentadienyltitanium dichloride] and 2 mols allyl alcohol, I was prepared from stoichiometric amounts of the starting materials in the presence of ammonia to bind HCl. The structure of I was determined by IR spectroscopic analysis. Polymerization of I in toluene solution at 100°C for 10 hr in the presence of 0.1% benzoyl peroxide yielded the trimer of I, as shown by molecular-weight measurements and IR and elemental analysis data. Copolymers of I, together with polystyrene or poly(methyl methacrylate), were produced by heating 10% I solutions in styrene or methyl methacrylate at 120°C for 3 hr in the presence of 0.5% benzoyl peroxide. The copolymers are orange transparent solids with molecular weights of 22,100 and 70,000. IR spectroscopic analysis of the copolymers showed that the titanocene groups [sic] are located in the side chains and that the backbones of the copolymers differ from those

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ACCESSION NR: AP3006746

of polystyrene and poly(methyl methacrylate). The softening point of the copolymer with styrene (120C) is higher than that of polystyrene (100C). Orig. art. has: 2 figures.

ASSOCIATION: Institut elementorganicheskikh soyedineniy AN SSSR
(Institute of Organoelemental Compounds, AN SSSR)

SUBMITTED: 23Dec61 DATE ACQ: 30Sep63 ENCL: 00

SUB CODE: CH NO REF SOV: 003 OTHER: 002

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L 19444-63 EPF(c)/EWP(j)/EWT(m)/BDS ASD/ESD-3 Pg-4/Pr-4 RM/WW/MAY
ACCESSION NR: AP3006747 S/0190/63/005/009/1288/1291

AUTHOR: Korshak, V. V.; Sladkov, A. M.; Luneva, L. K.; Bulgakova, I. A.

TITLE: Study in the field of coordination polymers. 16. Synthesis of polymers based on orthotitanates and bis-(Beta-diketones)

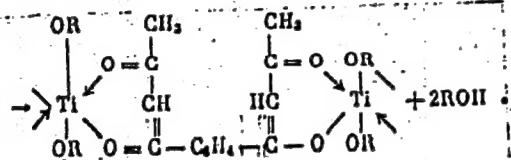
SOURCE: Vy*okomolekulyarny*ye soyedineniya, v. 5, no. 9, 1963,
1288-1291

TOPIC TAGS: polymers, coordination polymers, soluble coordination polymers, soluble coordination polymer synthesis, synthesis, acetoacetic acid. 2,2'-terephthaloyldi-. ethyl ester, copper acetate, acetic acid. copper salt, copper, nickel, cobalt, magnesium, mercury, 1,3-butanedione. 1-phenyldi-, 2-propanedione. 1-terephthaloyldi-, H_4TiO_4 . alkyl ester, H_4TiO_4 . tetraethyl ester, 2,4-pantanedione, 1,3-butanedione. 1-phenyl-, complex, H_4TiO_4 . tetra-tert-butyl ester, hydrolysis, coordination polymer property, property

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L 1944-63
ACCESSION NR: AP3006747

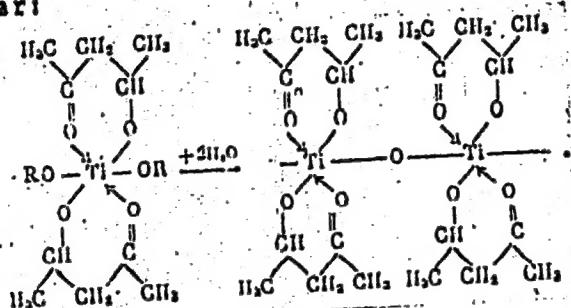
ABSTRACT: Soluble coordination polymers have been prepared by the following methods: 1) Use of addenda with polar substituents. Heating of a 5% alcohol solution of ethyl 2,2'-terephthaloyldiacetoacetate with an excess of a saturated alcohol solution of copper acetate yielded a coordination polymer in the form of a green precipitate. The polymer withstands heating to 200°C, is readily soluble in diethylformamide, and is slightly soluble in alcohol, benzene, and acetic acid. Similar products were prepared using Ni, Co, Mg, and Hg. 2) Synthesis of complexes of diketones with metals having the coordination number 6. Heating of terephthaloyldiacetone with tetraethyl or tetra-tert-butyl orthotitanate in dry xylene, with stripping off of the theoretical amount of alcohol, yielded products fully soluble in xylene and having the general formula (as confirmed by elemental analysis),



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By addition of petroleum ether, these products can be precipitated from xylene solution as a yellow fine crystalline substance partly soluble in benzene and dimethylformamide. The molecular weight of the product prepared with tert-butyl titanate was determined by the cryoscopic method to be 800, corresponding to that of the dimer.

3) Synthesis of acetylacetone or benzoylacetone complexes with tetra-tert-butyl titanate and their hydrolysis with the theoretical amount of water:



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